DOCUMENT RESUME

ED 232 016 CE 036 467

AUTHOR Campbell-Thrane, Lucille; And Others
TITLE Building Basic Skills: Models for Implementation. Special Publications Series No. 41.
INSTITUTION Ohio State Univ., Columbus. National Center for Research in Vocational Education.
SPONS AGENCY Office of Vocational and Adult Education (ED), Washington, DC.
PUB DATE 83
CONTRACT 300-78-0032
NOTE 48p.; For related documents, see CE 036 465-466.
AVAILABLE FROM National Center Publications, National Center for Research in Vocational Education, 1960 Kenny Road, Columbus, OH 43210 (Order No. SN41--$5.75).
PUB TYPE Guides - Non-Classroom Use (055) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Basic Skills; Case Studies; Check Lists; Classroom Techniques; Competence; Delivery Systems; Educational Needs; Educational Planning; *Educational Practices; Educational Strategies; Fused Curriculum; Guidelines; *Instructional Development; Models; Problem Solving; Program Design; Program Development; *Program Implementation; School Districts; *Skill Development; Teaching Skills; *Vocational Education

ABSTRACT

This report, the third in a series of works dealing with improving vocational students' basic skill levels, uses a case study approach to examine the process at the local district level of selecting, planning, and implementing a basic skill delivery model. Presented first are an introductory discussion of the background and purpose of the report and an overview of the instructional delivery models described in the report. The case study of one district's implementation of a basic skills development model addresses the following topics: the population to be served by the model; the problem of basic skills deficiencies in vocational students' program planning and problem solving; program selection and development; a scenario for the integrated model of instruction (a model involving infusing basic skills instruction into vocational classes); a scenario for the nonintegrated model (a model calling for conducting basic skills instruction in a classroom setting separate from vocational training); and a scenario for the combination model (a blend of elements of the integrated and nonintegrated models). Concluding the report is a checklist for guiding decisions on selecting a basic skills model. A list of vocational teacher competencies necessary to assist students in improving their basic skills and a list of references and suggested readings are appended. (MN)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

Special Publications Series No. 41

ED232016

BUILDING BASIC SKILLS:
MODELS FOR IMPLEMENTATION

Lucille Campbell-Thrane
Kevin Manning
Karen Okeafor
E. Jane Williams

The National Center for Research in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210

1983

CE036467

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

THE NATIONAL CENTER MISSION STATEMENT

The National Center for Research in Vocational Education's mission is to increase the ability of diverse agencies, institutions, and organizations to solve educational problems relating to individual career planning, preparation, and progression. The National Center fulfills its mission by:

- Generating knowledge through research
- Developing educational programs and products
- Evaluating individual program needs and outcomes
- Providing information for national planning and policy
- Installing educational programs and products
- Operating information systems and services
- Conducting leadership development and training programs

For further information contact:

Program Information Office
National Center for Research
in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210

Telephone: (614) 486-3655 or (800) 848-4815
Cable: CTVOCEDOSU/Columbus, Ohio
Telex: 8104821894

FUNDING INFORMATION

Project Title:	National Center for Research in Vocational Education, Applied Research and Development Function
Contract Number:	300780032
Project Number:	051 MH20004
Educational Act Under Which the Funds Were Administered:	Education Amendments of 1976, P.L. 94-482
Source of Contract:	U.S. Department of Education Office of Vocational and Adult Education Washington, DC 20202
Contractor:	The National Center for Research in Vocational Education The Ohio State University Columbus, Ohio 43210
Executive Director:	Robert E. Taylor
Disclaimer:	This publication was prepared pursuant to a contract with the Office of Vocational and Adult Education, U.S. Department of Education. Contractors undertaking such projects under government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official U.S. Department of Education position or policy.
Discrimination Prohibited:	Title VI of the Civil Rights Act of 1964 states: "No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." Title IX of the Education Amendments of 1972 states: "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance." Therefore, the National Center for Research in Vocational Education Project, like every program or activity receiving financial assistance from the U.S. Department of Education, must be operated in compliance with these laws.

TABLE OF CONTENTS

Page

FOREWORD v

EXECUTIVE SUMMARY vii

INTRODUCTION 1

- Background 1
- Purpose 2

VOCATIONAL EDUCATION AS A DELIVERY SYSTEM FOR BASIC SKILLS 3

- Overview of the Instructional Delivery Models 3

THE LOCAL DECISION: A CASE STUDY 15

- Background and Population 15
- The Problem 16
- Planning and Problem Solving 16
- Program Selection and Development 17
- The Integrated Model: A Scenario 19
- The Nonintegrated Model: A Scenario 22
- The Combination Model: A Scenario 25

LOCAL SELECTION OF A BASIC SKILLS MODEL 29

- Checklist for Guiding Decisions on Selection of a Basic Skills Model 29

SUMMARY 33

APPENDIX. Vocational Teacher Competencies: Assisting Students in Improving Their Basic Skills 35

REFERENCES AND SUGGESTED READINGS 41

FOREWORD

Vocational educators have become increasingly concerned about delivering basic skills instruction in conjunction with vocational curricula. Strengthening the relationship between students' basic skills levels and their vocational competencies is viewed to be a major factor in students' initial employability, their later job mobility, or their pursuit of further education and training.

This document should assist local-level vocational education planners, administrators, and practitioners who want to improve students' basic skills performance through vocational program delivery. It presents three approaches to the delivery of vocational and basic skills education. From the descriptions of these models, educators should be able to determine whether an integrated, nonintegrated, or combination approach to basic skills learning in the vocational education context will better suit their students' programmatic needs.

This report builds upon earlier research studies that reviewed the relationships between students' basic skills achievement and their various patterns of participation in vocational education.

Appreciation is extended to the following individuals who reviewed and critiqued the report: Dr. Michael Crowe, with expertise in educational administration and learning psychology; Ferman Moody, Associate Director of the Personnel Development Division at the National Center and former Commissioner of Basic Education, Pennsylvania State Department of Education; Dr. Henry C. Ellis, professor at the University of New Mexico, with expertise in cognitive psychology; Dr. Jessie Roderick, professor at the University of Maryland and specialist in language arts teacher education at the elementary education level; and Dr. Thomas Long, professor at Pennsylvania State University with expertise in educational research and basic education.

Special appreciation is extended to Deborah Black who spent many hours in manuscript preparation. Final editing was provided by Sharon L. Fain and Catherine C. King-Fitch of the National Center's Field Services Division.

Robert E. Taylor
Executive Director
National Center for Research
in Vocational Education

EXECUTIVE SUMMARY

Mathematics skills and the communication skills of reading, listening, speaking, and writing have been considered important tools for obtaining and holding a job in our society. As part of an ongoing effort to study the problems connected with improving vocational students' basic skills levels, this report briefly summarizes the results of analyses of data from three local education agencies related to basic skills and patterns of participation in vocational education. It then presents and evaluates three models for delivering basic skills instruction to vocational students. Using a case study approach, it examines the process, at the local district level, of selecting, planning, and implementing a basic skills delivery model. Finally, a checklist is provided to help local educators and administrators make decisions about appropriate approaches for meeting local needs for basic skills instruction in conjunction with vocational education.

This report, in an effort to fulfill the need for such guidelines, presents three models for delivering basic skills instruction in conjunction with vocational education.

The *integrated model* represents an effort to infuse basic skills instruction into the vocational classroom wherever appropriate to the vocation and the needs of the students. Vocational teachers identify basic skills requirements for their career areas and teach these skills in conjunction with the vocational content.

The *nonintegrated model* is a fairly traditional one, with basic skills instruction being conducted in a classroom setting separate from vocational training. Responsibility for basic skills instruction rests with subject matter specialists rather than vocational teachers.

The *combination model* is a blend of elements of the integrated and nonintegrated models, chosen to meet the educational needs and resources of the particular school district. It varies with administrative structure, budget, and other pertinent variables.

A comparison of the three models yields the following conclusions about advantages and disadvantages:

- The integrated model is generally more advantageous than the nonintegrated in terms of organization, facilities, and cost because vocational instructors teach basic skills to students in their classes. Additional inservice training for vocational teachers is often needed, but not extra teachers, space, or rooms. The advantages of the integrated program are distinctly greater for students, their families, and the community because basic skills instruction is job-relevant and because more students receive instruction.

- The major advantages of a nonintegrated program are likely to be experienced by teachers and administrators. This program results in the least structural change to the regular classroom and requires no extra responsibilities to be assumed by regular classroom teachers.

- The greatest disadvantages of the integrated model are the following:
  - The reduced time that vocational teachers have available to devote to vocational content
  - The need for vocational teachers to attend to both the vocational and the basic skills needs of students who have varying levels of basic skills
  - The fact that linking basic skills education and vocational requirements may result in lower skill transferability than in more generic programs and that seriously deficient students may not have enough time to catch up in terms of basic skills
- The major disadvantages of the nonintegrated program are the following:
  - Decreased vocational relevance of basic skills instruction for individual students
  - Increased scheduling problems
  - Additional space and personnel costs
  - The fact that "pull-out" instruction causes students to miss other instruction taking place in the regular classroom during their absence
- The advantages and disadvantages of the combination model depend entirely on the elements chosen to make up the program. However, this model has a great potential for being successful on a local basis simply because it is tailored to the local situation. When a local district conducts a careful analysis of students' educational needs, attitudes of staff and students, available resources, and similar factors, it can plan and implement a program that is responsive to the local situation and therefore likely to meet its own goals.

A chart comparing the integrated and nonintegrated models provides greater detail about the advantages and disadvantages with regard to the five patterns of participation. The case study illustrates the local planning process in relation to each of the three models, and the checklist provides a means by which local personnel can begin their own process of planning for delivery of basic skills instruction.

INTRODUCTION

Background

Educators, employers, and family members talk about the importance of a good foundation in basic skills. Everyone agrees that success on the job cannot be reached without a solid preparation in reading, math, and communication skills. Educators consider basic skills to be simply learning math, reading, and communication. Business and industry leaders require that those same basic skills be *used* to find solutions to work-related problems that promote productivity and, consequently, increase profit through a reduction in the cost of making products or providing services.

Successful participation in our society is based upon the individual's reading and mathematical skills and the communication skills of listening, reading, speaking, and writing. These basic skills, as designated in the Basic Skills Improvement Act,[1] are crucial to demonstrating employability and occupational competence; to acquiring further education and training; and to achieving upward and lateral occupational mobility. In addition, they represent areas of learning that should be fostered in all public education programs, including vocational education. A number of research studies and related reports support the belief that basic skills and vocational preparation exhibit integral and complementary natures (Bottoms 1979; Carnegie Council on Policy Studies in Higher Education 1979; Long 1980; Sawhill 1979; and Thurow 1979).

At a practical level, assessments of a variety of contemporary occupations (including those considered to be at entry level) suggest that many jobs are becoming increasingly complex and now require workers to have basic skills that were not considered essential a few years ago. The results of such appraisals are reinforced by assessments of employer expectations, which suggest that employers "expect schools and training programs to deliver the basics, if nothing else" (Datta 1982, p. 140).

According to Datta, when vocational educators consider measures to address or resolve the basic skills deficiencies of their students, there are three fundamental possibilities they should weigh. *First*, they may rely upon the previous educational instruction to provide students with basic skills instruction. This view suggests that basic skills deficiencies are best addressed before the student enters a vocational program and that no further systematic effort will be necessary or effective. *Second*, vocational educators may consider the job of improving vocational students' basic skills the responsibility of academic and/or general education programs. This view is congruent with the movement toward instructional specialties at the secondary level and is further developed in this report in the discussion of the nonintegrated model of the basic skills program. *Third*, vocational educators may consider the job of improving their students' basic skills to be their own responsibility. This view is presented here as a viable and valued alternative, principally through the integrated model of basic skills instruction.

In addition, the results of a series of research studies conducted over the past several years have shown that higher payoffs from vocational training can be expected when basic skills

[1]U.S. Congress, P.L. 95-561, Title II: Basic Skills Improvement Act, 95th Cong., 2d sess., 1 November 1978.

instruction (principally remedial) and vocational skills acquisition are functionally tied together (Huff et al., 1977; Larson 1979; Kirsch and Guthrie 1977-1978; Northcott 1975; and Sticht et al., 1972).

Purpose

Although there is no one way to teach basic skills, schools are expected to deliver the basics (if nothing else), and vocational education is a part of the educational delivery system. Therefore, vocational educators must make decisions about how they will deliver the basics. They can decide either to deliver basic skills instruction within the vocational classrooms (in an integrated approach) or to deliver basic skills separately from vocational instruction (in a nonintegrated approach) through some type of remedial process. This report describes and summarizes the characteristics, advantages, and disadvantages of these two major alternatives in program delivery and offers suggestions for a third approach, that of combining the two models.

However, implementing one of the proposed models to enhance the basic skills development of vocational students is a complicated process, which invariably is embedded in the customs and practices of the local education agency. Thus, having knowledge of models for basic skills delivery is not sufficient when faced with the task of translating these models into successful vocational education programs. The decision to choose one model over another may be determined more by philosophical and political concerns than by logical or empirical evidence, which, in itself is seldom conclusive. The school system, the type of administration, the quality of students, the attitudes of teachers, and the finances of the district, to name a few variables, are major determinants in the selection and implementation of a basic skills delivery system.

To assist vocational educators in thinking beyond the definitional aspects of the three models and considering the practical concerns of selecting and implementing a basic skills delivery model, this report provides a fictional account—a case study, if you will—of one LEA's process of grappling with these concerns. The account includes three scenarios that permit the reader to imagine hypothetical situations in which the emphasis is to increase the students' basic skills performance. The scenarios provide the reader with descriptions of the kinds of information that might be required when choosing to implement one of the basic skills delivery models and provide a practical basis for vocational educators to use in considering the tradeoffs when implementing a basic skills delivery system.

VOCATIONAL EDUCATION AS A DELIVERY SYSTEM FOR BASIC SKILLS

There are crucial factors one must consider when deciding how best to deliver basic skills instruction in the vocational education context. To assist school personnel in making a choice between an integrated, a nonintegrated, or a combination basic skills delivery system, this section provides an overview of the three models. The overview is followed by a chart comparing the salient features, with their corresponding advantages and disadvantages, of two of the three approaches, the integrated and nonintegrated models. (The combination model is not included because its salient features will vary with the choice of elements taken from the other two models.)

Figure 1 defines the key terms used in this section; careful review of these definitions will facilitate understanding of the overview and chart.

Overview of the Instructional Delivery Models

The following discussion highlights salient characteristics of the integrated, nonintegrated, and combination models defined in figure 1 and describes ways in which students' participation levels may affect the applicability, utility, and effectiveness of those models.

Nonintegrated Model

From the observations made of vocational basic skills programs, the nonintegrated model appears to be currently the most commonly used approach to improving vocational students' basic skills. It emphasizes teaching basic skills in the context of conventional disciplines through delivery by subject matter specialists. Thus, mathematics teachers teach mathematics, science teachers teach basic science and physics principles, and English or reading teachers teach reading, writing, and perhaps listening. Those basic skills that are not learned in classes taught by subject matter experts may still be acquired in other classrooms, but there is usually no institutional mandate for other content specialists (e.g., history, chemistry, or home economics teachers) to assume responsibility for remedying their students' basic skills deficiencies.

An important assumption underlying the use of the nonintegrated model is that basic skills acquisition can be effectively taught apart from the students' vocational and academic interests. The curriculum emphasizes a minimum level of basic skills for all students regardless of their vocational interests or pursuits. By keeping basic skills education generic, (that is, not specific to particular vocational areas) it is assumed that transfer of skills will allow students greater flexibility in their later career and educational undertakings.

In the nonintegrated model, students with low test scores are "pulled out" into separate classes to be taught very basic principles by specialists. Often, vocational students placed in such classes do not receive the reinforcement they need to apply the basics to the particular occupational skills they are attempting to acquire. Therefore, the levels and amounts of reinforcement needed vary with the teachers, the students, and the program.

- **Participation level** - The narrative that follows refers at times to students' levels of participation in vocational education simply as high, medium, or low. These categories suggest the intensity to which students are involved in a single vocational program. Thus, high participators are students who have three hours of vocational classes five days a week for two years (see the Appendix). The original research considered these students as concentrators. Medium participators are the students who explore—that is, they spend several hours a day in the junior year in one program area. The next year, they may switch to another program area. The change in programs does not permit them to concentrate on any one vocational area. Low participators are those students who fall into incidental/personal patterns. Perhaps they take one course in personal typing or bookkeeping, or shorthand for their own personal edification, not for occupational use.

- **Integrated model** - This term refers to a basic skills instructional delivery model that places responsibility for basic skills instruction with vocational educators. Individual teachers identify basic skills requirements for specific career areas and teach these skills in conjunction with the vocational content. This model represents an effort to infuse basic skills instruction into the vocational classroom wherever such infusion is appropriate to the vocation and the needs of the individual student.

- **Nonintegrated model** - This basic skills instructional delivery model places responsibility for basic skills instruction at the school and district levels. In this respect, this model is a fairly traditional one, with basic skills instruction being conducted in a classroom setting separate from the students' vocational training. As contrasted with the integrated model, responsibility for basic skills instruction in the nonintegrated model rests with subject matter specialists who typically are not vocational educators.

- **Combination model** - This instructional delivery model is a blend of elements of the integrated and nonintegrated models that best suits the particular school district's educational needs and resources. It varies with administrative structure, budget, and other pertinent variables.

Figure 1. Definitions of key terms

Students classified as high participators in vocational programs may find a nonintegrated basic skills program largely irrelevant to their vocational preparation needs and difficult to accept in terms of their interest in "practical" as opposed to "academic" educational experiences. They may also experience personal inconvenience or find that they are unable to take other desired courses because of scheduling conflicts with the basic skills program. In short, having committed themselves to a particular vocational area, high participators may not receive maximum benefit from a nonintegrated basic skills program.

Vocational students who participate in vocational education programs in low to moderate degrees may benefit more from a generic approach to basic skills instruction than from an integrated program. The generic program may provide these students, who are unsure of their vocational goals, with greater potential for skill transfer and may lead to future vocational

flexibility. Nonetheless, regardless of their participation levels, vocational students with low basic skills levels may have been relatively unaffected by the generic basic skills instruction they received in previous years. Such students may find, then, that basic skills instruction in a vocational context would "make more sense" because it relates to specific vocational offerings.

Thus, a basic skills program with perceived relevance may accomplish what has eluded these students for a major part of their school careers. The success of a nonintegrated program, therefore, can be enhanced for vocational participators (particularly high and low participators) if program materials and objectives are selected and developed using all the resources of the school system, especially those of the vocational education staff. Although this type of integration may be difficult to initiate and maintain because of territorial problems and philosophical differences between vocational and basic skills instructors, it is crucial to the overall success of such programs.

Integrated Model

The "add-on" character of many nonintegrated programs may cause students and others, including teachers, to think that basic skills instruction is a "necessary evil" that is separate and unrelated to the more important information to be gained through vocational education. As an alternative, the integrated model provides a plan or framework for delivering basic skills instruction on a continuous, vocationally relevant basis to all vocational students through the vocational classroom.

A basic assumption underlying the use of the integrated model is that there should be a relationship between the kinds and levels of basic skills taught and the basic skills requirements of a particular vocational area. Furthermore, according to this model, the vocational teacher is expected to assume major responsibility for identifying the basic skills requirements for entry into vocations in his or her area, identifying students' basic skills deficiencies, and teaching the skills-deficient students what is needed in the context of the appropriate vocation(s).

The attention vocational teachers give to basic skills in their classes under the integrated model will be a function of—

- administrative support for infusion;
- the teachers' interest in and ability to teach basic skills;
- the congruence between the students' basic skills levels and the teachers' perceptions of what is necessary to succeed in the vocation(s) in their areas;
- the time available to devote to basic skills in comparison with the time devoted to vocational content; and
- the teachers' self-perceived effectiveness in teaching basic skills.

With the integrated model, one would expect that students who participate at high or moderate levels in a vocational program will acquire higher levels of vocationally relevant basic skills than students who participate at low levels. Thus, those students who take a substantial number of courses in a vocational area over a period of years are likely to have an adequate exposure to the basic skills deemed essential to the service area studied. Also, high participation should reinforce learning in other ways—for example, through the use of sophisticated career-

related instructional materials. In addition, there are generally greater opportunities for teachers and students to build productive relationships that foster learning.

When using the integrated model, some problems may emerge for students who decide to change their service area specialization during training. Where the diagnosis of students' basic skills deficiencies and related remedial programming are tied to the basic skills requirements of particular vocations, a change of program may mean that students will be seen as having additional deficiencies in the new service area to which they transfer. These additional deficiencies may or may not be resolved by the time the student graduates (depending on the timing of the program change and the sequencing of the basic skills instruction afforded by the teacher in the new program area).

The Combination Model

The combination model, being—as the name implies—a combination of features of the other two models, cannot be described in terms of salient characteristics. It can take as many forms as there are creative educators who have a clear perception of the needs of their district.

Combination approaches usually evolve from an analysis of the integrated and nonintegrated approaches in light of the local situation. Such an analysis, carefully done, can result in the adoption of selected elements of each model to create a tailor-made program that responds to local priorities.

Comparing the Alternatives

To assist in such an analysis, the salient features, advantages, and disadvantages of the integrated and nonintegrated models are presented in table 1. This table presents some of the major points to be considered in the choice of a basic skills delivery system with respect to the following areas:

- Students
- Instruction/Learning
  - Staffing
  - Administrators
  - Instructional Specialists
- Environment
  - Setting
  - Space Allocation
- Content
  - Methodology
  - Family/Community
- Cost

TABLE 1

SUMMARY OF THE INTEGRATED AND NONINTEGRATED MODELS

I. Students

	Integrated	Nonintegrated
Characteristics	Basic skills delivery mode is in the appropriate skill classroom. The students are taught basic skills in every vocational classroom--whenever the student appears to need reinforcement in a skill relevant to the requirements of the vocational area.	The students needing basic skills instruction receive it via conventional disciplines through delivery by subject matter specialists in math, English, science, etc.
Advantages	• Job-relevant instruction is likely to enhance student motivation to learn basic skills regardless of level of participation; for high-level participators it is very important. • More vocational students, at all levels of participation, will get basic skills instruction. • Those students with high levels of participation should acquire or be reinforced in the job-specific basic skills required for entry-level jobs. • Basic skills instruction, provided in all vocational classes, has potential for reinforcement of students' basic skills, both over time and through participation in diverse service areas.	• Students' occupational mobility, both vertical and horizontal, may be enhanced by learning generic skills. • Students with low to moderate participation in a service area may especially benefit from a generic approach to basic skills instruction if they are unsure of their vocational goals or if they are in service areas in which few jobs will be available following graduation.
Disadvantages	• Vocational students with adequate basic skills may be slowed down by other students' needs for special instruction in basic skills. • Students may be handicapped by area-specific basic skills instruction if they later change educational programs or make a job change. • The portability of basic skills instruction will depend on the basic skills requirements of the vocation in which the student receives training and the basic skills requirements in the vocation to which the student would like to move. • Since remediation of students' basic skills will be diffused among all vocational teachers, it is conceivable that some students with deficient basic skills levels may be overlooked or "passed on" by individual teachers--especially students with the lowest levels of participation in a particular vocational program. • Students with minimal involvement in a vocational program are likely to have minimal exposure to the basic skills related to that vocation.	• Generic instruction may seem irrelevant and difficult to vocational students, especially to those with high levels of participation in skills training. • Because of the generalized orientation, basic skills assessment is likely to be conducted using instruments geared to the program needs of academic students. • Vocational students with high levels of participation may be misidentified as having deficient or adequate skills when vocational area requirements are considered. • Instruction is usually provided by discipline experts who may be unfamiliar with basic skills requirements in vocational areas and with techniques for teaching basic skills relative to the specific occupational interests of the students. • Linkage between basic skills instruction and students' vocational interests may not be made. • Providing basic skills instruction in special settings may encourage adverse labeling of participating students. • Vocational students may experience personal inconvenience or be unable to take other desired courses because of scheduling conflicts between basic skills and vocational courses. • Students who have an interest in taking diverse vocational courses are handicapped. • Students spending only two to three hours per week in a basic skills program will be getting only short-term intermittent skills reinforcement opportunities.

Table 1--Continued

II. Instruction/Learning
A. Staffing

	Integrated	Nonintegrated
Characteristics	Individual teachers identify basic skills requirements for specific careers and teach skills in conjunction with vocational content. Infusion occurs wherever infusion is important to the vocation and needs of students.	Responsibility for basic skills instruction is at school and district levels. Instruction is conducted in classroom (nonvocational setting) by subject matter specialists who are typically not vocational educators.
Advantages	• Teachers are able to work with a group of students sharing similar career interests. • Teachers respond knowledgeable to students' vocational interests; those interests link to basic skills. Teachers have opportunities to develop that linkage; especially with the high participators. • Teachers have a need to develop stronger collegial relationships with teachers in the same service area in order to effectively plan and implement basic skills infusion in a sequence of courses. • A more holistic instructional plan can be developed in which both vocational and basic skills content are the responsibility of the same teacher.	• Teachers are likely to view this model favorably because it can easily be added onto an existing curriculum without disturbing the conventional classrooms or imposing additional responsibilities on the regular staff. • This model may also have the effect of "relieving" the regular staff from providing extra or remedial instruction to the most seriously skills-deficient students. • Teachers in the basic skills classrooms are able to focus their attention on particular educational objectives relative to the basic skills needs of the students.
Disadvantages	• Teachers must teach students with varied basic skills levels. • Teachers must balance time between two major content responsibilities. • Additional training is needed to enable them to teach basic skills and to diagnose basic skills deficiencies. • Teachers cannot "pass on" low achievers to basic skills instructional specialists. • Teachers may resent the additional responsibilities they are asked to assume with no additional class time or pay.	• The basic skills teachers must teach students with diverse academic and career interests. This limits their ability to link instructional techniques and content with their students' vocational interests unless individualized or small group instruction is possible. • Territorial problems and philosophical differences between vocational and basic skills instructors may make for strained and inefficient working relationships in coordinating the nonintegrated program, assuming that some interaction between these teacher groups is desirable to enhance the involvement of medium and high participators in vocational education.

B. Administrators

Characteristics	Administrators must establish an institutional mandate for vocational content specialists to assume responsibility for remedying basic skills deficiencies. They must seek additional strategies if staff are uncooperative.	Outside monies must be found to cover expense of additional teachers and classrooms. Administrators must resolve the problem of tying in the concerns of the basic skills program with the rest of the curriculum, despite the seeming independence of the program.
Advantages	• Administrators are likely to acquire school board and community support for this model on the basis of its low cost related to a reliance on existing personnel and space. • Administrators may also be able to maintain continued support for the program if such outcomes as higher vocation-related basic skills levels, higher vocational skills due to stronger relevant basic skills, and increased success in the job placement of graduates can be demonstrated.	• Outside funding for a special remedial program may be more easily acquired than monies for a program only for vocational students. • A special "add-on" program will not disrupt existing programs or responsibilities of the regular faculty. Thus, administrators will not have to cope with resistance on the part of the teachers to assume more work. • Administrators may be able to document substantial gains in the basic skills levels of the very lowest achieving students when they are singled out for special instruction.

Table 1--Continued

	Integrated	Nonintegrated
Disadvantages	• Funds to cover inservice training and special instructional materials have to be generated. • Enlisting faculty support for the program may be difficult. • Administrators may have difficulty attracting and holding desirable vocational educators because of the increased instructional demands that will be placed on them. • Administrators may have to consider additional strategies for meeting the basic skills instructional needs of students with low levels of vocational participation. • This is complicated by the problem of effectively identifying levels of student participation for program planning purposes.	• Where outside funding has not been obtained, the program is very expensive to the school district since it requires special personnel and classroom space. • Expenses will be especially high when an effort is made to include a large group of students with low skills rather than just the most extreme 5 to 10 percent of the skills-deficient students. • Attempts to coordinate a nonintegrated program including academic and vocational faculties for the benefit of vocational students may be difficult. • Creating a schedule for the students in the basic skills program that is compatible with their vocational program involvement and personal commitments may be difficult.
	C Instructional Specialists	
Characteristics	Additional staff teach basic skills to students from various skill areas at one time.	Specialists in math, communication skills, and science teach generically.
Advantages	• Use of specialists in the instructional area is unnecessary or deemphasized.	• Use of instructional specialists may improve program success.
Disadvantages	• If used as a part of an integrated program, the specialist may not understand what basic skills are needed for each specific area.	• Instructional specialists are expensive and often do not understand skill areas.
	III. Environment A. Setting	
Characteristics	Identified students are placed in skill area of their choice. Students' levels of participation become an advantage in exposing them to basic skills in the area of interest. Students acquire basic skills instruction "automatically" within the vocational courses they elect to take.	Standardized measures are used to determine basic skills deficiencies. Students having need for basic skills instruction are brought together in a "special" classroom.
Advantages	• Skills-deficient students are identified relative to basic skills requirements of particular occupations. • Fitting basic skills diagnosis and instruction to a concrete work context may be viewed as especially valuable to high vocational participators. • Division of students among teachers is related to students' vocational interests and teachers' vocational area expertise. • Since students' levels of vocational participation should be directly related to their exposure to basic skills in a given service area, high participators should benefit most from this organizational form.	• No disruption to other instructional programs is likely to occur.

Table 1--Continued

	Integrated	Nonintegrated
Disadvantages	• The model would inadequately serve the basic skills instruction needs of students with low levels of vocational participation.	• Skills-deficient students are identified based on a standardized measure not relevant to the career goals. • High-level participators with adequate basic skills for their service area may nonetheless be identified by the standardized measure as skills-deficient. • High-level participators in another service area may not be identified as skills-deficient even though they would be considered skills-deficient relative to the occupational requirements in their vocational area. • Labeling of students may become a problem. • Scheduling of basic skills instruction may pose problems for students, especially those with high vocational participation. • There may be a tendency to include only the most seriously skills-deficient students in the program--thus neglecting many others who are only marginally skilled.
B. Space Allocation		
Characteristics	The skill classroom is the locus of basic skills teaching. A certain area may be set up for basic skills. Carrels can be supplied within laboratory.	Special rooms are allocated for specialized teachers to teach each basic skill.
Advantages	• No special room requirements may be necessary. • All teaching is done in the shop or laboratory. • Extra personnel costs are minimized.	• Standardization of content may reduce costs of instructional materials.
Disadvantages		• Special rooms are necessary.
IV. Content		
Characteristics	Curriculum for basic skills is based on skill areas and requirements for jobs in the world of work.	The content is determined on the basis of the basic skills need and may or may not have direct vocational relevance to the student.
Advantages	• The basic skills taught are job-relevant. • This is likely to be an especially important consideration for students with high levels of vocational participation. • Teachers use experiences from their own job-related work.	• Since the program focuses entirely on basic skills instruction, classroom time may be more efficiently used. • This model may result in greater skills portability for students who change vocational interests.
Disadvantages	• Instructional time must be divided.	• The content is not necessarily related to the vocational interests of students. • This may particularly result in lowered motivation in high-level vocational participators.

Table 1--Continued

A. Methodology

	Integrated	Nonintegrated
Characteristics	Vocational teachers use their expertise and experience related to actual job performance.	Methods are the traditional techniques used for teaching math, reading, and science. The variation depends on the capability of the teachers and the innovation and creative qualities possessed by teachers.
Advantages	• Teaching techniques may be variable.	• Teaching techniques may be variable.
Disadvantages	• Teachers must really be committed to teaching basic skills.	

B. Family/Community

Characteristics	The ongoing involvement of all vocational students with basic skills instruction results in direct and indirect benefits to the students' families, employers, and community.	While fewer students are served in this program, those who are included are the most skills-deficient. Additional training in basic skills may make the difference between employment and unemployment for the students--with their families and communities benefitting accordingly.
Advantages	• Combining basic skills instruction with vocational content results in greater parental support for the program. • Business people may view vocationally relevant basic skills instruction as better serving their human resource needs.	• The existence of a basic skills program is likely to be viewed favorably by parents and local employers in principle.
Disadvantages		• Insofar as students in the program are easily identified, labeled, and/or inconvenienced by adverse schedules, some parents may object to the structure of the program. • Employers may perceive that the basic skills taught are not sufficiently relevant to their employment needs and/or that an insufficient number of students are included in the program.

V. Cost

Characteristics	Many people consider vocational programs expensive because initial start-up and development of this program requires teacher inservice and the purchase of instructional aids and materials for teaching job-relevant basic skills.	Special space and instructional personnel are needed, as are the purchase of appropriate instructional aids and materials.
Advantages	• No new classrooms are needed. • The basis for the curriculum can be taken directly from textbooks already in use. • Problems and projects in basic skills are directly a part of materials and projects already going on.	
Disadvantages	• Inservice training of teachers and instructional materials costs may be high.	• Space and personnel costs may be high, especially if teachers, parents, and students consider basic skills an "add-on."

In addition, the chart suggests comparative strengths and weaknesses of each model.

The following conclusions can be drawn from this chart:

- The integrated program of basic skills delivery is generally more advantageous than the nonintegrated program in terms of organization, facilities, and cost because vocational instructors will be teaching basic skills to students in their classes. Additional inservice training for vocational teachers will probably be needed, but not extra teachers, space, or rooms. In addition, the advantages of the integrated program are distinctly greater for students, their families, and the community than those of the nonintegrated program because basic skills instruction will be job-relevant and more students will receive this instruction.

- The major advantages of a nonintegrated program are likely to be experienced by teachers and administrators. This program results in the least structural change to the regular classroom and requires no extra responsibilities to be assumed by regular classroom teachers.

- The greatest disadvantages of the integrated model are—

  - the reduced time that vocational teachers will have available to devote to vocational content because of their added responsibility to teach basic skills;

  - the need for vocational teachers to attend to both the vocational and basic skills needs of students having varied basic skills levels;

  - the fact that linking basic skills education and vocational requirements may result in skill transferability levels lower than those found in a more generic program and that it cannot really provide time or instruction necessary for seriously deficient students to "catch up."

- The major disadvantages of the nonintegrated program are—

  - the decreased vocational relevance of basic skills instruction for individual students;

  - the increase in scheduling problems;

  - additional space and personnel costs; and

  - the fact that "pull-out" instruction causes the student to miss other instruction that takes place with the regular class as it continues in the student's absence.

Of course, the selection of a delivery system for basic skills instruction is not a simple one. Not only are the advantages and disadvantages of the alternatives many and varied, but local situations are so different from one another that trying to weigh all of the variables to arrive at the best solution is a difficult task at best. In addition, the process of analysis and decision making that will lead to such a choice is complex in itself. Politics, budget considerations, and other realities of implementation are an inevitable part of that process.

Up to this point, we have examined the models themselves—their characteristics, advantages, and disadvantages that may affect local implementation. Let us turn now to the process of local analysis and decision making. To illustrate some of the situations and events

that may be encountered in this process, the next section of this report presents a fictional account of how one local education agency dealt with the problem of delivering basic skills instruction.

THE LOCAL DECISION: A CASE STUDY

When a school or district is faced with vocational students' low test scores on basic skills and with an increasing dropout rate, and parents and the business community are concerned that youth are not prepared to meet the challenges of the world of work, school administrators are usually pressured to do something about correcting this deficiency. The first question is usually, What should we do—what are the alternatives?

In such a situation, one approach is to research the alternatives and prepare a brief for presentation to the school board on different methods of providing basic skills instruction to vocational students. Frequently, the vocational department is asked to take part in this effort. It should be apparent from the foregoing sections of this report what some of the alternatives are. But where does one start in preparing a brief? What pitfalls and problems can be anticipated? How does one assess the local situation? How does one project the characteristics of the three instructional models on local situations? And what happens after the brief is presented?

To help answer such questions, the following fictional account, or case study, has been developed, in which a hypothetical school district is seeking to provide vocational education for students who are considered deficient in basic skills. The case study depicts the school's process of analyzing options for program design and implementation, and how the realities of finances, politics, and other factors affect that process.

The background and contextual aspects of the hypothetical school district are described first, followed by an outline of the various stages undertaken by the school to implement the project. Finally, three detailed scenarios are presented, describing the planning and implementation of each of the three delivery models. (It should be noted that in a real situation, it is unlikely that all three models would be carried to the implementation stage in a single school. They are presented in this way to help the reader anticipate the various kinds of problems and considerations that may arise in taking any one of the models from planning to implementation.) This case study can be used as the basis for local planning by following the same procedural outline and substituting data about the local school district.

Background and Population

Located in a school district about fifty miles from a major metropolitan area, this particular vocational education program is offered at a comprehensive high school with 1,200 students in grades nine through twelve. There are sixty teachers, two guidance counselors, a curriculum specialist, and three administrators including a principal and two assistant principals on the staff.

The high school serves most of the county. The town in which the high school is located has a population of about 10,000, in which most of the workers are either blue collar, engaged in agriculture, or working in light industries. A number of workers travel to nearby cities for employment.

The high school offers ten vocational programs. Because of its rural location, the agricultural program accounts for 40 percent of the enrollments; the construction trades (plumbing, electricity, and so on), 45 percent; cosmetology, 5 percent; office procedures, 5 percent; computer science and electronics, 2 percent; and all others, 3 percent. Most of the students who are considered concentrators are enrolled either in agriculture or construction trades.

About 30 percent of the high school graduates go on to two- or four-year colleges. Fifty percent of the student body enrolls in the various vocational programs. Only a small percentage of the entire student population is comprised of minority students.

The Problem

As in many other communities, there is a growing awareness of the need to concentrate on basic skills instruction. In recent years, student scores on standardized tests have dropped significantly, giving rise to practical concerns among the faculty about the ability of graduates without adequate basic skills to survive in the world of work. In order to initiate and develop a program of basic skills instruction, the high school principal called a meeting to discuss problems and to determine how basic skills instruction might be approached.

Planning and Problem Solving

As a result of the general discussion meeting, the principal set up a basic skills planning committee, to which he appointed several faculty and staff members. He requested that the curriculum specialist act as chairperson, while he himself served as an ex officio member. The principal presented two objectives for the first meeting: (1) to assess the extent of the students' basic skills deficiencies and (2) to determine the type of program needed to remedy those deficiencies.

The basic skills committee met for two hours under the direction of the curriculum specialist and came to the following conclusions: (1) a general deficiency in basic skills existed, based upon data provided by the guidance staff; (2) the heavy concentration of vocational education students suggested the need for creation of special basic skills programs in this area; and (3) additional discussion was necessary in order to determine the kinds of programs needed to remedy the problem.

The next meeting of the planning committee was devoted to outlining the extent of the vocational students' basic skills problem. The guidance staff reviewed recent test scores, which indicated that the vocational students' scores had dropped 30 percentage points in the various basic skills over the past five years.

The overall perception of the committee was that the basic skills performance of many of the vocational students was inadequate to prepare them to enter the world of work. Even though the vocational students showed a real interest in career preparation and a fairly high level of motivation to learn in the various vocational areas, many students were not equipped to handle diverse learning materials. A concern was raised about how well future graduates would fare in finding and retaining jobs, though local employers had not yet voiced any complaints about the basic skills preparation of the vocational students they had hired.

There was also an intense discussion on not only the suitability of texts currently in use, but also the relevance of the tasks being taught. Several planning committee members voiced

objections to the methods used by the state and the district to assess and implement vocational programs, but the committee as a whole was unsympathetic to the problem. The chairperson pointed out that such problems, although important, were not the concern of the committee and, in any event, could not be easily resolved.

The chairperson reemphasized to the committee the seriousness of the problem of vocational students' basic skills achievement levels and reminded everyone that a strategy should be devised to address the problem. In addition, the chairperson recommended that the committee meet in another week to discuss various program strategies and to assume the responsibility for gathering data, not only on the number of students who would require basic skills instruction but also on strategies that could be implemented in the proposed program.

At the following week's meeting, the chairperson indicated that if current standards were to be used to identify students with basic skills deficiencies, approximately 500 of the school's vocational students would be in need of some type of basic skills instruction.

Based on current budget and staffing levels, the large number of students needing basic skills instruction created a serious planning problem. For example, faculty members in the English, mathematics, and science departments were especially concerned because a new basic skills program might mean extensive preparation and work on their part to accommodate additional classes. Although some of the students who were found to be deficient in basic skills achievement were already enrolled in regular English and mathematics classes, there was still a great need to provide increased instruction in the basic skills. Any such increase would create a considerable strain on the fiscal budget as well as on the time teachers had to prepare and to teach.

The committee chairperson requested that at the next meeting, presentations be made on four aspects of the problem: (1) various program possibilities, (2) staffing considerations, (3) sources of funding, and (4) learning materials needed. Four pairs of staff members were assigned to the task, each pair to study one of the four major concerns.

Program Selection and Development

At the next meeting, the representatives from the English and mathematics departments, who were assigned the task of defining program possibilities, presented information on three possible options. Based on their review of previous research at the National Center for Research in Vocational Education on basic skills in vocational education, the instructors presented information on the integrated, nonintegrated, and combination models for delivering basic skills instruction.

The integrated model entailed the provision of basic skills instruction through the regular vocational classroom by having vocational instructors teach basic skills as a normal part of the curriculum. One of the primary advantages of the integrated program seemed to be its potential for expansion to meet changing needs. The nonintegrated program consisted of "add-on" courses taught by subject matter specialists in English and mathematics. The combination model consisted of specialists teaching basic skills in the laboratory or shop with assistance several days a week from the vocational instructor and advanced students from that particular vocational area.

After the presentation of the three models, an extensive discussion ensued, which necessitated further elaboration upon the models. The vocational staff were especially concerned

about the time and training requirements needed to initiate any basic skills program. Additional concerns were expressed about the number of students who could be accommodated in the nonintegrated program. Several persons remarked that perhaps the most productive way might be the combination model, taking the most advantageous parts of each of the other two models presented.

Two faculty members discussed the difficulty of securing funding for a special program, although they remembered that funding *was* available to create a nonintegrated program. For the past two years, the state education agency had been making funds available to establish instructional programs designed to increase basic skills levels. Special funds for an integrated program, however, would be harder to obtain, as the monies would have to come out of the existing budget. The same would probably apply to a combination model. However, the combination model might be considered as a "pilot." Perhaps the state department would be interested in a new idea.

Several members of the committee wanted to know how staff assignments and the selection of learning materials would be handled. According to the integrated model, the entire vocational faculty would be involved in inservice training, because vocational instructors would provide basic skills instruction as well as teach vocational content. Learning materials would consist of resources that used mathematical computations related to the skill area. Materials for teaching communication skills that would facilitate better communication on the job would also be based upon the particular skill area.

The number of staff needed for the nonintegrated plan would pose a more difficult problem than the number needed for the integrated approach. If it were assumed that approximately 500 students would be enrolled in the nonintegrated program, the present staff of English and mathematics teachers would not be able to accommodate these students. Either additional staff would have to be hired or the number of students participating in the program would have to be dramatically reduced. Another problem mentioned was that the regular English and math teachers would have to adapt materials to fit the needs of particular skill areas.

The chairperson of the basic skills planning committee suggested that both the integrated and nonintegrated programs be considered and conceptualized separately. There were several creative members of the committee who volunteered to develop a combination model. Three subcommittees were thus formed: the first (chaired by the director of the agricultural education area) to conceptualize the integrated program; the second (jointly chaired by the heads of the English and mathematics departments) to conceptualize the nonintegrated program; and the third (jointly chaired by a husband/wife team—one who taught math, the other construction technology) to conceptualize a combination program. Each subcommittee contained members from vocational education, English, science, and mathematics.

Each subcommittee was expected to examine all aspects of its assigned program and to develop a plan for obtaining funding for implementing and evaluating the program. The three scenarios that follow represent the processes the subcommittees pursued in planning for the implementation of the integrated, nonintegrated, and combination approaches. It should be remembered that, although it is unlikely that all three approaches would be carried to the implementation stage in a single school, they are presented in this way to illustrate a wide range of possibilities in the planning of a delivery system.

The Integrated Model: A Scenario

Everyone who attended the first subcommittee meeting was optimistic that some type of basic skills program was possible, and they were certainly in agreement on the need for such a program. They were concerned that if basic skills proficiency levels continued to decline, their entire vocational program would be seriously undermined.

The subcommittee for an integrated program believed that such a program could not succeed without the involvement of every vocational faculty member. During a meeting called to discuss the problem, some of the vocational instructors stated they were not in favor of teaching basic skills in the vocational classroom. A few members of the vocational faculty also believed that basic skills were the responsibility of the central administration or of the English, science, and mathematics departments. The most frequently heard criticism was that there would not be enough time to concentrate on basic skills and to teach the regular vocational courses concurrently.

Because of the conflict between the subcommittee and the vocational faculty, the chairperson proposed a compromise that would involve the agriculture department. A pilot basic skills program could be implemented the following year in the agricultural area. Pretesting for basic skills proficiency would be done at the beginning of the year, with a follow-up assessment conducted in the spring.

Although faculty members were not enthusiastic about the plan, they agreed to it provided that it would be implemented on a temporary basis with an extensive reevaluation during the spring term. The subcommittee was satisfied that it would at least be able to implement a positive program.

Structuring the Integrated Program

When the subcommittee asked the guidance director to report the number of students enrolled in the agricultural program who were deficient in basic skills, the guidance director indicated that there were between 150 and 200 students who could benefit from basic skills instruction. This finding affirmed the suitability of agricultural students as participants in the pilot test of the integrated program. To simplify the assessment procedure, the subcommittee decided to base the pilot program on the guidance staff's pretest evaluation of those students needing basic skills instruction, and to have the guidance staff also conduct the follow-up evaluation of participating students by using standardized test results.

The guidance staff suggested that the program's evaluation could be conducted by comparing the test results of agriculture students with the test results of an equivalent group from the previous year. For statistical purposes, a random sample from each group would be selected. In addition, the faculty and students would complete an attitude questionnaire about the program.

Moving from the assessment issue, the subcommittee next considered how to teach the basic skills, the possible duration of instruction, and inservice training requirements. The subcommittee decided the following: (1) course content would remain the same but would be supplemented with practical experience, such as filling out employment forms, role playing, and so on; (2) basic skills instruction would extend from the beginning of the school year until April of the following year; and (3) inservice training would be conducted for one week in the spring and two weeks at the beginning of the fall term.

Involving the Vocational Faculty

The subcommittee had decided that involving the vocational faculty was crucial to creating a successful basic skills program. Although a number of the faculty expressed different concerns about teaching the basic skills, they agreed upon the need for an inservice program and decided to request thirty hours of after-school time for special inservice training.

The faculty, in conjunction with the subcommittee, decided to formulate yet another subcommittee to plan the inservice training for the faculty and to make further decisions about the design and use of any special learning materials.

The chairperson of the integrated approach subcommittee agreed to contact the principal about the availability of funding for inservice training. It was also decided that the inservice subcommittee would meet on a biweekly basis and would report back to the primary committee when its task was complete.

Funding

The chairperson of the subcommittee met with the principal to explain what progress had been made in developing the integrated basic skills model and explained why it was necessary to begin by pilot testing the program in only one area.

The chairperson explained the need to make funds available for special inservice sessions and for special instructional materials. The principal was also informed that about thirty hours of inservice time would be needed to prepare the entire agricultural faculty for the basic skills program.

The principal was concerned about using only the agricultural area for the pilot program and was uncertain about whether or not monies could be made available for staff training. Yet the principal understood the practical reasons for starting the pilot program and felt the needed monies might be more easily obtained since this pilot program was only for a small segment of the vocational students. He promised to check with the school board to see if the needed monies would be available.

Finalizing the Planning of the Integrated Program

The next basic skills planning session involved both the primary committee and the integrated approach subcommittee. The chairperson of the subcommittee reported on the meeting with the principal and indicated that they would know within the next week whether or not the money for the basic skills pilot program would be available.

The subcommittee on inservice training and learning materials then reported on their efforts. They recommended that individual faculty members be free to use whatever vocationally related reading, writing, mathematics, and communication exercises they considered appropriate for their course(s). They suggested such exercises as—

- reading vocationally related magazines and newspapers (e.g., *Popular Mechanics* and *Pennsylvania Farmer*);
- writing about job-related problems, such as how to handle a difficult customer;

- completing application forms for regular employment and for state or civil service employment;

- solving vocationally related problems (e.g., keeping records for cream and milk data, egg production, and grain and feed sales); and

- role playing problems likely to be experienced on the job with supervisors or customers.

Although there was a concern about duplication of effort, it was felt that students would benefit from increased basic skills exposure. The subcommittee thereby recommended that each faculty member create frequent opportunities for practicing these basic skills during regular classes.

Arrangements were made to pay teacher salaries for the inservice training, although the school board questioned why extra salaries had to be paid for an educational endeavor as fundamental as basic skills instruction. Since the principal vigorously supported the expenditures for this program, however, the board approved them.

With the help of the chairperson of the primary committee, the subcommittee coordinated the inservice workshops. One week of training was conducted during the spring term after school, and an additional two weeks were conducted at the beginning of the fall term.

Both inservice training sessions went smoothly. Videotapes were used to illustrate role-playing techniques. Employment forms were selected for use and coordinated by subject matter area to avoid duplication. The most difficult problem, however, was to implement the mathematics and English components of the basic skills program.

Several faculty members were uncertain about having enough time to handle this type of instruction. They were also uncertain as to whether or not they had the skills to teach these areas successfully. The head of the committee reminded the faculty that the program's intent was not to replace completely any courses then being taught with the basic skills subjects, but instead to reinforce what had already been presented in other areas. The chairperson emphasized that an awareness of those areas was more necessary than a full instructional agenda. It was also explained that the purpose of informally emphasizing mathematics and English was to promote further increased competency in the basic skills.

Implementing the Program

Before the program began, the guidance staff tested all of the students in the agricultural program using a recognized standardized test of basic skills. A random sample of the agriculture students was selected and matched with an equivalent group of students in other vocational areas. This random sample of students from other vocational areas served as the control group and did not receive the integrated program. In addition, the guidance staff planned to administer a brief questionnaire to obtain faculty and student assessments of the program.

During the first week of the program, there was much confusion. Students were annoyed at having to deal with basic skills in the vocational classroom. Because of the strong consensus among the faculty on the importance of basic skills, however, many of these difficulties were easily surmounted. Also, the chairperson of the basic skills committee was still available to deal with problems as they arose.

Assessing the Program

At the end of the program, the guidance assessment indicated that there had been a 15 percent increase in basic skills scores for the students in the integrated program. The control group had experienced a 4 percent decline in their basic skills scores. This difference between the groups was both quantitatively and qualitatively significant.

Attitude questionnaire data indicated that the faculty were pleased with the program. Several faculty members remembered that it gave them a relevant means of applying technical subject matter. The students were not as happy with the program, but felt it helped them to see the relevance of the basic skills material being taught.

Overall, the program appeared to be successful. The basic skills committee would now, using these evaluations, see if the program could be expanded during the following year.

The Nonintegrated Model: A Scenario

The first meeting of the subcommittee on the nonintegrated approach was called by the representatives of the mathematics and English departments who were cochairing this subcommittee. The subcommittee consisted of two representatives each from mathematics, science, and English, and three representatives from the various vocational education skill areas.

One of the chairpersons reiterated that the origin of the committee stemmed from the serious concern at the state and local levels about the decline in basic skills achievement levels among vocational students. The principal had requested that a concrete plan be developed to deal with basic skills deficiencies.

This chairperson also reminded the subcommittee that, according to the guidance staff, vocational students' standardized test scores had dropped 30 percentage points during the past five years. In addition, about 80 percent of the 600 students in vocational education had some type of basic skills deficiency.

Because of the current staffing level, the chairperson indicated that it would not be possible to implement any basic skills program easily; however, it was necessary to create a plan that could accommodate students while raising basic skills achievement levels.

Several members of the subcommittee were familiar with learning skills centers where students participate on a voluntary basis and receive individualized basic skills instruction. The chairperson requested that members of the committee be prepared to discuss the individualized instruction/skills center concept at the next meeting.

Structuring the Nonintegrated Program

The next meeting of the subcommittee focused on the creation of a learning skills center. The most hotly debated issue was the number of students who could be properly handled. Consensus held that no more than 100 students could be instructed in basic skills at that time.

The subcommittee proposed that these 100 students be selected by individual vocational faculty members as the need arose. When the number of students exceeded 100, additional students would be accepted as vacancies became available. The learning skills center would operate with flexible scheduling according to students' basic skills needs.

The structure of the learning skills center would incorporate individualized instruction, group activities, and hands-on experience in such exercises as role playing and completing employment forms. Following an assessment of the students' basic skills achievement levels, contracts would be drawn up with the students agreeing to participate in the program for specified periods of time.

The chairperson recommended that in order to implement a learning skills center, office space, staff, and materials would need to be made available, and suggested that funding possibilities be discussed with the principal. Several other subcommittee members, however, suggested that the plan be presented to the entire faculty before requests were made for funding.

Because this was a pilot program, the subcommittee also asked the guidance counselors to conduct an evaluation of the program. Standardized test results for students in the program would be compared with those of comparable students not in the program. Attitude questionnaires would also be administered both to students and to faculty members.

Involving the Vocational Faculty

The subcommittee met with the vocational faculty in order to explain the plan that had been developed for teaching the basic skills required in vocational classes and to present information on the learning skills center. Several faculty members were very concerned that because of the limited number of students instructed, the effort would not be very helpful. The chairperson explained that there were too many students to handle in an initial program. If the program were properly handled, perhaps it could later be expanded.

Other faculty were concerned with the way the program would be structured. They believed that one reason students had basic skills difficulties was that they were "turned off" by school. The chairperson explained that the focus of the program would be on the individual, with materials geared toward vocational application.

When another faculty member asked whether it was legal or fair to provide a basic skills program only for vocational students, the chairperson indicated that this matter would have to be discussed with the principal.

In principle, the faculty approved the plan. They also agreed that declining basic skills achievement levels posed a serious problem.

Funding

The chairperson presented the program to the principal. A one-year budget of approximately $200,000 had been estimated for renovation of classroom space, purchase of equipment and materials, and hiring of five new staff members (including a director). The principal indicated that state funds were available for such programs. After meeting with the principal, the chairperson studied the forms that the state provided in order to seek funds for a center to teach basic skills. The matter was then discussed at the next basic skills committee meeting.

The principal was also very concerned about the small number of students that could be accommodated. The chairperson reviewed the situation and its potential for growth—at which point the principal understood the material difficulties and was willing to approve the program since the possibility existed for expansion in the future. The principal did not think that a

program that included only vocational students would be a problem as long as it was viewed as a pilot program.

Finalizing the Planning of the Nonintegrated Program

The next several meetings of the basic skills committee were spent attempting to complete the application for state monies—a process that took about one month. The committee was optimistic about receiving funding, since it was a new state program and few schools had applied for such funding.

According to the committee's plan, the learning skills center would be set up in the following way. Physical facilities would consist of two unused rooms and a number of renovated classrooms. One room would include space for one staff member, audiovisual equipment, and basic learning materials. The other room would have space for another staff member, desks for fifteen students, and a conference area.

All student participation would be voluntary, and students would be identified by individual faculty members. The term of instruction would be flexible, depending upon the needs assessment of each student. "Open-entry/open-exit" would be the policy. Instructional emphasis would be on mathematics, science, English, and oral communication. Standard basic skills instructional materials would be purchased.

The pilot program would be conducted for one year, with a formal assessment of the change in basic skills achievement taking place at the end of the school year. At that time, the participants' basic skills achievement would be compared to that of a matched control group of nonparticipants. Assessment would be handled by the guidance staff.

Implementing the Program

The program was soon formally approved. However, the funding was only three-quarters of the amount originally requested. This deficit was made up by modifying their renovation plans.

Inservice training for the new staff members was handled during the first month of the school year and proceeded smoothly. Concrete efforts were also made during this time to ensure that the vocational faculty were aware of the structure of the program.

During the first year of operation, the center was able to accommodate 180 students. The greatest operational problem was finding the time to schedule students during a busy day. The newness of the open-entry/open-exit policy caused some teachers concern. Both of these matters were to be studied further.

Assessing the Program

The guidance counselors reported that the standardized test results indicated a 12 percent improvement in basic skills achievement levels among students in the nonintegrated program. Students in the control group showed a 4 percent decline.

Questionnaire data revealed that teachers and most students believed the program was beneficial. Students especially appreciated being able to study the basic skills in an

individualized program. The results of their efforts were both qualitatively and quantitatively significant as determined by their test scores. Thus, the basic skills committee decided to pursue plans to expand the program.

The Combination Model: A Scenario

The Martins were very excited at the first subcommittee meeting. They had prepared themselves to chair this committee in an effective way. As Mrs. Martin said, "We accepted this challenge because Neville and I have discussed our concern over the basic skills levels of our students many times. In fact, this has taken over our dinner conversations for the past two weeks." Other members of the subcommittee smiled because they had previously been exposed to Neville's and Jan's effervescent personalities. The other representatives from mathematics, English, science, and vocational education shared the enthusiasm of their leaders.

These six people did not need to be reminded that the standardized test scores had been dropping during the past five years that the dropout rate had increased during that same period. Since the school had always been known for its scholarship, the current state of affairs was serious.

All of the committee members had studied the models presented and were anxious to speak to the merits of their own ideas.

Structuring the Combination Program

Since the vocational school was located in another building, the search for space to teach basic skills began. The construction technology teacher suggested that it would not be difficult at all to section off one corner of each laboratory or shop to set up a classroom. This room would become known as the "theory" room for basic skills, the philosophy being that if the basic skills are taught in the lab or shop area, they are taught as important principles that become applied to the production process in the skill area rather than as a math process. Posters, projects, and examples of basic skills used in that particular vocational field demonstrate the "real" reason for learning basic skills and stimulate students to view them as an integral part of the vocational work.

Involving the Vocational Faculty

The subcommittee decided that since their plan would call for specialists in math, science, and English to come to the "theory" room to teach basic skills within that vocational classroom, the first step would be to organize the working together of vocational teachers and the specialists. The specialists would need to study the vocational textbooks to select the curriculum to be taught.

Therefore, they planned the teaching to include the use of advanced students (to be called student assistants or helpers) within the vocational area to help in teaching basic skills. The subcommittee knew that experiences using peers had proven to be very successful in vocational shops. (Students relate well to other students; they "speak the same language.") The specialists would spend three days a week in the theory room, while the advanced students would be available the other two days to oversee and to help when necessary.

Since this approach would require much preplanning and coordination to be successful, the subcommittee felt it necessary for the group to seek funding to work together in planning, writing, and testing out the curriculum. Student helpers would need guidelines for their work, which must be clearly defined in order for the advanced students to feel a sense of pride and for the remedial students to feel a sense of accomplishment.

The skill teacher's role would be to teach the skill trade, oversee the "theory" room, assist the student helpers, and coordinate the schedules of the specialists. Everyone was to be an important part of a team.

Funding

The subcommittee worked together to determine the amount of money necessary to develop curriculum, to prepare exemplary materials, to produce pre- and posttests for determining the students' capabilities, to set up guidelines for use of student helpers, and to consider other responsibilities as deemed necessary. The committee agreed that $150,000 would be needed to renovate the laboratories and shops, purchase materials, and prepare for the development of materials.

The principal accepted the recommendations of the committee and told them he was very pleased that they had come up with such an innovative idea. This subcommittee's work certainly reflected the enthusiasm of the cochairpersons. The principal gave the committee forms to complete for requesting state reimbursement. The project sounded exciting, and nothing like it had been attempted before in the state.

Finalizing the Planning of the Combination Program

The committee members were anxious to get started on the paperwork for the state. They worked very hard for the next three weeks to complete the state application. Each time they met, the combination model and a plan for its use became clearer and more exciting.

The formal plan had five parts:

- Classroom change or renovation
- Development of pre- and posttests for basic skills
- Development of curriculum to be taught in each vocational area
- Guidelines for student workers
- Evaluation

Trade magazines and journals would be collected in addition to the texts already in use. Specialists and shop teachers would review materials as well as existing curriculum to determine what emphasis should be placed on mathematics, English, and communication.

Several of the committee members suggested that the shops be set up in an entrepreneurial mode, with students acting as owners, job dispatchers, bookkeepers, supply room clerks, and so on. As the ideas flowed, the staff became more excited, and so did the students who were asked

to review ideas. The curriculum could easily be developed from the many ideas the committee was generating.

A well-formulated plan began to take shape as the discussion turned to use of student assistants. It was decided that the entire months of July and August would be spent in development.

One of the committee members suggested that at least one advanced student from each skill area should be invited to review the plans as they progressed. The preview of ideas would be helpful and would also get all the students interested from the beginning.

Implementing the Program

The state department approved the plan. The $150,000 was agreed upon with the stipulation that if the idea was successful, a team from the school would present the idea at the state vocational meeting the following May.

The math, English, and science specialists began to work with the vocational staff the first week of July. Because of the enthusiasm, the procedure ran smoothly. If there was a problem, it was because so many innovative ideas came forth. By the beginning of August, the staff invited advanced students from each of the occupational areas to come by the school and talk about the new curriculum. The students agreed that the idea was great, and several offered to bring materials they found while working at summer jobs, that could be used in teaching basic skills.

By the end of August, all pieces were in place. Each instructor was anxious for classes to begin. The room renovations were to be undertaken by teachers and students as soon as classes began. Since the renovation would be part of the program of work, the students worked on construction plans immediately. Excitement ran high, and everyone joined in the new project with enthusiasm. By Open House time in October, the instructors and students were excited to show parents and friends their new "theory" rooms.

Teaching basic skills began. The specialists were proud of their work. The student assistants found helping their peers a rewarding experience. They admitted that many times explaining a principle to someone else clarified the problem for them. The basic skills students found new reason to learn skills that they had never before considered important. The student assistants, many of whom had already worked on jobs, were real catalysts in stimulating learning experiences.

Assessing the Program

The basic skills specialists administered the pre- and posttests. They were delighted to find that the average math, science, and English scores increased fifteen to twenty points, when only seven months of class work had been completed. Several students who had indicated they planned to drop out at the end of the school year decided to stay for another year.

The guidance staff, comparing the standardized scores with those of general and academic students, found that most of the general students' scores had dropped and that the academic students' scores had only slightly increased.

Questionnaires were given to students who were taking basic skills and to the student assistants who worked with their classmates so that each could evaluate the program. The results were overwhelmingly in favor of the new program. When asked if they resented taking time from shop work to learn basic skills, 95 percent of the students felt that they were moving along faster in the skill area because they now understood the basic skills. The results of their efforts were both qualitatively and quantitatively significant as determined by their test scores.

Both the specialists and the vocational staff were extremely pleased with the results. Needless to say, their presentation at the state vocational conference was a smashing hit.

LOCAL SELECTION OF A BASIC SKILLS MODEL

The preceding sections have decribed three possible models for delivering basic skills instruction and illustrated the process of planning and implementing such models. However, there still remains the problem of assessing the local situation, with the characteristics of the three program models in mind, and deciding on the "best" approach to meet local needs.

In selecting the most appropriate model, one must consider the unique features of the individual system—its philosophy, politics, idiosyncrasies, budget and staffing concerns, and other factors. To assist in this effort, the following checklist is provided. It may be used as a guide in assessing the local situation and developing a basic skills program tailored to meet local needs. It may also be modified for use as an opinion survey with school board members, faculty, or other groups. It is hoped, in any event, that it may be helpful to those concerned with improving the basic skills of vocational students in undertaking the complex task of identifying the very best approach for delivering basic skills instruction in the context of the local situation.

Checklist for Guiding Decisions on Selection of a Basic Skills Model

Part I	Yes	No
1. Do most of the students have adequately developed basic skills?	____	____
2. Are vocational courses a part of a comprehensive high school?	____	____
3. Are basic skills taught in the context of conventional disciplines?	____	____
4. Is your present arrangement really serving basic skills needs?	____	____
5. Do you have additional classroom space that would accommodate vocational students when being taught basic skills?	____	____
6. Does your school have a mandate that content specialists assume responsibility for remedying basic skills?	____	____
7. Do staff feel that basic skills are generic and that transfer of skills permits greater flexibility in later educational and career undertakings?	____	____

8. Do staff coordinate and cooperate in terms of program materials and objectives by selecting and developing all resources of the school system, including the vocational education staff? ____ ____

9. Do the staff have any problems with turf and territory? ____ ____

10. Are there philosophical differences between vocational and basic skills instructor? ____ ____

11. Do staff and students consider basic skills classes a "necessary evil"? ____ ____

12. Is outside funding available for a "special" basic skills program designed to serve only seriously skills-deficient students? ____ ____

Answering "yes" to ten of the twelve questions in Part I indicates that it may be appropriate to consider a nonintegrated approach to teaching basic skills.

Part II **Yes** **No**

13. Are the vocational courses housed in a separate vocational/technical school building? ____ ____

14. Do the staff and the vocational students see a relationship between the kinds and levels of basic skills taught for particular vocational areas? ____ ____

15. Do vocational teachers assume major responsibility for identifying basic skills requirements for entry into vocational areas? ____ ____

16. Do vocational teachers identify basic skills deficiencies? ____ ____

17. Do vocational teachers take responsibility for teaching skills-deficient students those basic skills needed in the context of the appropriate vocation? ____ ____

18. Is the administrator willing to support infusion of basic skills in the vocational classroom? ____ ____

19. Do vocational teachers have interest in and ability to teach basic skills? ____ ____

20. Is a part of the available time devoted to teaching basic skills, as opposed to teaching vocational content? ___ ___

21. Do the vocational teachers perceive themselves as effective in teaching basic skills? ___ ___

22. Do students who change from one vocational area to another have to relearn basic skills? ___ ___

23. Would staff and administration approve of teachers and students designing a "theory" room or of using advanced students as peer helpers? ___ ___

24. Do the vocational teachers feel that spending shop or laboratory time on teaching basic skills can enhance the employability of the students? ___ ___

Answering "yes" to ten of the twelve questions in Part II indicates that it may be appropriate to consider an integrated model for teaching basic skills.

A fairly even distribution between "yes" and "no" on the two sets of questions indicates the advisability of considering a combination approach based on the advantages of each model in order to devise the best system for the local situation.

SUMMARY

As indicated by the patterns of participation model and the results of the work of Weber and associates, high school students do not approach the study of vocational education in a uniform manner. Some students take vocational education courses for enrichment. Others pursue vocational education studies in order to train for a specific career. These different goals and the attendant variations in participation create a challenge for schools in dealing with the problems of students who are deficient in basic skills.

When schools consider measures to address or resolve the basic skills deficiencies of their vocational students, there are three basic possibilities they must weigh:

- Focusing upon improving students' basic skills deficiencies prior to their entering a vocational program
- Considering the job of improving vocational students' basic skills as someone else's responsibility (e.g., general and academic education programs should have the primary responsibility for improving all students' basic skills proficiencies)
- Considering the problem of remedying basic skills deficiency as the responsibility of vocational educators, given the constraints under which they must function

Local education agencies must answer the question of who is responsible for improving basic skills before they address the question of how and in what context to deliver basic skills instruction.

The previous discussion of the three general delivery models suggests the following:

1. The integrated program of basic skills delivery is generally more advantageous than the nonintegrated program in terms of program organization, facilities, and cost. In the integrated model the question of what basic skills should be taught is determined relative to specific job areas. Students receive basic skills instruction within the vocational education classroom. Since the students are not placed in special classrooms for the basic skills instruction, their availability for other desired classes is not limited. In addition, more students are instructed in a cost-effective way. Students with moderate to high levels of participation in vocational education should especially benefit from this program model.

2. The nonintegrated program of basic skills delivery has the advantages of not disrupting the existing curricula and of not requiring that additional instructional responsibilities be assumed by the vocational faculty. A well-planned nonintegrated program may also increase students' options for lateral vocational mobility if the students actually acquire a strong, generic set of basic skills. A major concern with the potential success of this program is that students having inadequate basic skills when they reach the tenth grade have probably already been exposed to generic basic skills instruction with little success. Thus, additional instructional efforts may do well to incorporate job-relevant reading, writing, mathematics, and role-playing exercises.

3. The combination program of basic skills delivery has the advantage of permitting specialists in mathematics, science, and English to teach the basic skills, but in conjunction with the vocational instructor's program of skill teaching. Since the students are not placed in special classrooms, there is no stigma attached to their taking additional work in basic skills. The students are instructed in a cost-effective way. The existing curriculum is enhanced, and the students will find it easier to move along in the skill area. Since the students have already been exposed to generic basic skills instruction with little success, the relevance of basic skills to the occupational skills they learn adds meaning and substance to remaining in school. Peer helpers, who speak the same language and who often have had on-the-job training, can share with students the importance of learning basic skills in a way that has special meaning.

APPENDIX

VOCATIONAL TEACHER COMPETENCIES: ASSISTING STUDENTS IN IMPROVING THEIR BASIC SKILLS

The following is a list of teacher competencies identified by National Center staff as being important for assisting students in improving their basic skills. The competency-identification process included the following major steps:

1. A group of nine national leaders with expertise in assisting students in improving their basic skills (vocational teachers, supervisors, and other experts) was identified and convened in January 1981. The group served as a DACUM committee, and under the leadership of a DACUM coordinator, the committee identified the teacher competencies needed to assist students in improving their basic skills. The DACUM (Developing a Curriculum) approach uses modified small-group brainstorming and consensus techniques to produce a chart of competencies. A total of 80 competencies in five functional areas was identified.

2. The 80 competency statements were refined and combined where necessary to eliminate overlap. In some cases, competencies deemed important in one functional area were added to other functional areas for consistency. This process yielded a total of 85 competencies. These were reclustered and sequenced into five functional areas, each of which will be developed into a single PBTE module.

The competency statements presented here may be useful for a wide variety of teacher training purposes. They are also designed to fit the needs of a national curriculum development effort in vocational teacher education. As such, they are consistent with, and augment, the 384 performance elements that form the development base of the 100 PBTE modules in the National Center's Professional Teacher Education Module Series.

Assist Students in Improving Their Reading Skills

1. Accept your responsibility in the provision of reading instruction.
2. Identify the reading skills required for entry into the trade/vocation.
3. Assess students' reading abilities.
4. Diagnose students' reading problems and reading levels.
5. Use care in interpreting existing student records.
6. Identify available instructional materials written at the appropriate reading level.

7. Use appropriate support personnel and materials.
8. Demonstrate a positive attitude toward reading.
9. Create a classroom environment conducive to reading.
10. Provide incentives to encourage student improvement.
11. Use students' special vocational interests to motivate them to read.
12. Teach appropriate technical and related vocabulary.
13. Demonstrate practical reading tips (e.g., skimming, pointing, underlining).
14. Develop students' ability to follow written instructions (e.g., have students read instructions and perform a specific series of handson activities).
15. Individualize reading instruction (e.g., through the use of modules).
16. Use small groups/pairings for reading activities.
17. Use reading games (e.,g., crossword puzzles, scramble, word search).
18. Use audiovisual techniques (e.g., audiotape reading assignments).
19. Assist students in using self-evaluation techniques to determine their reading comprehension.
20. Provide opportunities for practice and reinforcement of reading.

Assist Students in Improving Their Writing Skills

21. Accept your responsibility in the provision of writing instruction.
22. Identify the writing skills required for entry into the trade/vocation.
23. Assess students' writing abilities.
24. Diagnose students' writing problems (spelling, clarity, punctuation, grammar).
25. Provide standards for written materials (spelling, clarity, punctuation, grammar).
26. Provide model formats for written materials (memos, reports, business letters, work orders).
27. Provide vocationally related writing assignments.
28. Assign writing topics related to students' special vocational interests.
29. Encourage student use of appropriate technical and related vocabulary.
30. Individualize writing instruction.

31. Use writing games (e.g., paragraph scrambles).

32. Provide opportunities for students to critique writing samples.

33. Assist students in using self-evaluation techniques to determine their writing ability.

34. Correct students' writing errors (spelling, clarity, punctuation, grammar).

Assist Students in Improving Their Oral Communication Skills

35. Accept your responsibility in the provision of oral communication instruction.

36. Identify the oral communication skills required for entry into the trade/vocation.

37. Assess students' oral communication skills (speaking and listening).

38. Diagnose students' oral communication problems (e.g., grammar, pronunciation, clarity).

39. Teach appropriate technical and related vocabulary.

40. Encourage student use of appropriate technical and related vocabulary.

41. Correct students' errors in speech (e.g., focusing on one or two errors at a time).

42. Develop students' awareness of body language (nonverbal communication).

43. Use oral questioning techniques.

44. Ask students to repeat written and oral instructions to ensure their understanding.

45. Use role-playing techniques to improve oral communication.

46. Use oral communication games (e.g., rumor, one-way communication).

47. Have students give small- and large-group oral presentations.

48. Provide opportunities for students to practice their listening skills.

49. Teach techniques for using the telephone effectively.

50. Provide simulated and real-life opportunities for telephone use.

51. Assist students in using media to evaluate their own performance and progress.

52. Use guest speakers to stimulate student discussion.

53. Encourage students to take advantage of the opportunities for communication available through participation in student vocational organizations.

Assist Students in Improving Their Math Skills

54. Accept your responsibility in the provision of math instruction.

55. Identify the math skills required for entry into the trade/vocation.

56. Identify the math skills required to succeed in the vocational program.

57. Assess students' math skills.

58. Diagnose students' math deficiencies (e.g., inability to add and subtract).

59. Assess the appropriateness of math-related explanations in your instructional materials.

60. Identify available math-related materials appropriate to students' abilities and your vocational area.

61. Use appropriate support personnel and materials.

62. Teach appropriate technical and related math vocabulary.

63. Individualize math instruction.

64. Use students' special vocational interests to motivate them to develop their math skills.

65. Provide practical math application activities (compute income tax, balance checkbook, compute supply orders).

66. Provide simulated and real-life opportunities for math usage (e.g., business situations).

67. Use audiovisual aids to teach and reinforce math concepts.

68. Use tutors (e.g., students, retirees, volunteers) to aid students in improving math skills.

69. Assist students in using self-evaluation techniques.

Assist Students in Improving Their Survival Skills

70. Accept your responsibility in the provision of survival skills instruction.

71. Assist students in clarifying their values.

72. Assist students in setting realistic short-term and long-term goals.

73. Assist students in developing personal decision-making skills.

74. Assist students in dealing with a multiplicity of adult roles and responsibilities.

75. Promote good safety habits.

76. Assist students in developing appropriate personal hygiene and nutrition habits.

77. Assist students in developing time management skills.

78. Provide opportunities for students to improve their interpersonal relationship skills (e.g., through the student vocational organization).

79. Assist students in developing personal financial skills.

80. Help students to become more knowledgeable consumers.

81. Teach students to use reference books (e.g., telephone book, dictionary, maps, thesaurus).

82. Help students to identify, understand, and use sources of career information.

83. Prepare students to find, obtain, retain, and exit employment.

84. Assist students in developing an awareness of their legal rights and responsibilities on the job (e.g., minimum wages).

85. Assist student in developing an awareness of their rights, responsibilities, and benefits as employees (e.g., company policy, insurance benefits, and promotion policy).

REFERENCES AND SUGGESTED READINGS

Bachman, J.G. *Young Men in High School and Beyond: A Summary of Findings from the Youth in Transition Project*. Washington, DC: U.S. Department of Health, Education, and Welfare, Bureau of Research, 1972.

Berryman, Sue E. *Vocational Education and the Work Establishment of Youth: Equity and Effectiveness Issues*. Santa Monica, CA: The RAND Corporation, 1980.

Borus, M.E.; Crowley, J.E.; Rumberger, R.W.; Santos, R.; and Shapiro, D. *Youth Knowledge Development Report 2.7: Findings of the National Longitudinal Survey of Young Americans, 1979*. Washington, DC: U.S. Government Printing Office, 1980.

Bottoms, J.E. Testimony presented before the House Subcommittee on Elementary, Secondary, and Vocational Education, Washington, DC, 1 March 1979.

Brown, Lawrence L., and Gilmartin, Kevin J. *Measures of Participation in Vocational Education: Enrollments, Students, and Exposure*. Washington, DC: U.S. Department of Education, Office of Technical and Analytic Systems, 1980.

Campbell, P.B.; Orth, M.N.; and Seitz, P. *Patterns of Participation in Secondary Vocational Education*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1981.

Carnegie Council on Policy Studies in Higher Education. *Giving Youth a Better Chance*. San Francisco: Jossey-Bass, 1979.

Corman, L. *Basic Skills Proficiencies of Secondary Vocational Students*. Washington, DC: National Institute of Education, U.S. Department of Education, 1980.

Datta, L.E. "Employment-Related Basic Skills." In *Education and Work*, 1982 Yearbook, edited by Harry F. Silberman. Chicago: National Society for the Study of Education, 1982.

Federal Register, Vol. 44, no. 115, 13 June 1979, pp. 33960-33961. Department of Health, Education, and Welfare, Office of Education. Request for Suggestions Regarding Implementation of Eight Bureau of Occupational and Adult Education Priorities for Vocational Education.

Fleming, E.L.; Maroney, R.; and Straser, M.L. "The Vocational Re-evaluation of the National Longitudinal Study of the High School Class of 1972 Base Year." Paper presented at the annual meeting of the American Educational Research Association, Washington, DC, 1975.

Grasso, J.T., and Shea, J.R. "Effects of Vocational Education Programs: Research Findings and Issues." In *The Planning Papers for Vocational Education Study*, edited by Study Project Director Henry David. Washington, DC: National Institute of Education, 1979.

Huff, K.H., Sticht, T.G., Joyner, J., Groff, S.D., and Burkett, J.R. *A Job-Oriented Reading Program for the Air Force: Development and Field Evaluation* (AFHRL-TR-77-34). Lowry AFB, CO: Air Force Human Resources Lab., Technical Training Div., May 1977. NTIS No. AD-A047-203.

Kirsch, I., and Guthrie, J. "The Concept and Measurement of Functional Literacy." *Reading Research Quarterly* 3, (1977-78): 485-507.

Larson, G.A. "The Effects of Literacy Training on Performance in Occupational Training Programs in the U.S. Army." Unpublished doctoral dissertation, Rutgers University, 1979.

Long, T.E. *Basic Mathematics Skills and Vocational Education*. Information Series No. 199. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1980.

Lotto, Linda. *Building Basic Skills: The Results from Vocational Education*. RD Series No. 237. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1983.

Mertens, D.M.; McElwain, D.; Garcia, G.; and Whitmore, M. *The Effects of Participation in Vocational Education: Summary of Studies Reported Since 1969*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1980.

Mikulecky, L., and Haugh, R. *Reading in the Business Education Classroom*. Washington, DC: National Education Association of the United States, 1980.

Moe, A.J.; Rush, R.T.; and Storlie, R.L. *The Literacy Requirements of a Secretary on the Job and in a Vocational Training Program*. Lafayette, IN: Purdue University, 1979. ERIC document reproduction service no. 182 696.

National Center for Research in Vocational Education. *Performance-Based Teacher Education Materials*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1978.

National Center for Research in Vocational Education. *Research Report: Patterns of Participation in Vocational Education by Secondary Students in Several LEAs*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1983.

National Council of Supervisors of Mathematics. "Position Paper on Basic Mathematical Skills." In *What Do We Know about Standards for Effective Basic Skills Programs?* Edited by Task Force Chairman B. Ross Taylor, et al. Washington, DC: U.S. Government Printing Office, 1979.

Northcott, N.W. "Functional Literacy for Adults." In *Reading and Career Education*, edited by D.M. Nielson and H.F. Hjelm. Perspectives in Reading Series No. 19. Newark, DE: International Reading Association, 1975.

Nunez, A.R., and Russell, J.F. *Manufacturers' Views of Vocational Education*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1981.

Rosenbaum, James E. *Making Inequality: The Hidden Curriculum of High School Tracking*. New York: John Wiley & Sons, 1976.

Sawhill, I.V. Testimony presented before the Senate Committee on Labor and Human Resources, Washington, DC, 24 October 1979.

Schafer, Walter E., and Olexa, Carol. *Tracking and Opportunity: The Locking-out Process and Beyond*. Scranton, PA: Chandler Publishing, 1971.

Sticht, B. *Literacy and Vocational Competence*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1978.

Sticht, T.G.; Caylor, J.S.; Kern, R.P.; and Fox, L.C. "Project REALISTIC: Determination of Adult Functional Literacy Skill Levels." *Reading Research Quarterly* 7, (1972): 424-465.

Stufflebeam, D.I.; Foley, W.J.: Gephart, W.J.; Guba, E.G.; Hammond R.I.; Merriman, H.D.; and Provus, M.M. *Educational Evaluation and Decision Making*. Itasca, IL: Peacock Publishers, 1971.

Thurow, L.C. "Vocational Education as a Strategy for Eliminating Poverty." In *The Planning Papers for the Vocational Education Study*, Vol. 1, edited by Study Project Director Henry David. Washington, DC: U.S. Government Printing Office, 1979.

Weber, J.M.; Silvani-Lacey, C.; Williams, E.J.; Winkfield, P.W.; Manning, K.J.; Okeafor, K.; and Denniston, D. *Interim Report: Comparative Study of Basic Skills in Vocational Education*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1982.